

What is claimed is:

1. A query-and-response processing method for receiving a search request concerning a query input by a user and searching a database to present search results to the user, comprising:

a search request analysis step of analyzing said search request provided by said user;

a search criteria generation step of generating search criteria based on the result of the analysis of said search request;

a search execution step of searching said database according to the generated search criteria;

a query intention analysis step of analyzing the intention of the query based on the result of the analysis of said search request;

an output formatting step of selecting items to be presented to the user and determining the output format of search results according to the result of said analysis of the intention of said query; and

a presentation step of receiving the result of said output formatting step to present data to said user.

2. The query-and-response processing method according to claim 1, wherein:

said query intention analysis step comprises a step of determining a topic item, said topic item being a core topic of the search request; and

said output formatting step comprises a step of selecting an item to be presented to said user based on the determination as to whether or not the item is the topic item.

3. The query-and-response processing method according to claim 2, wherein said output formatting step comprises a step of processing information by adjusting the order of which the presentation items obtained as the search results.

4. The query-and-response processing method according to claim 2, wherein said output formatting step comprises a step of adjusting the level of detailedness of the presentation to provide all the specific items or only main items relating to a particular subject.

5. The query-and-response processing method according to claim 2, wherein said output formatting step comprises a step of classifying the search results according to specified item values to organize by category the information to be presented to the user.

6. The query-and-response processing method according to claim 1, wherein said output formatting step comprises a step of using data specifying an item relating to a particular item to add the item relating to the particular item to the items to be presented, after the items to be presented to said user is determined.

7. The query-and-response processing method according to claim 1, wherein:

said search criteria generation step comprises a step of storing information about correspondence between a word used for specifying search criteria in an item in the database and an item name in the database; and

said output formatting step comprises a step of replacing said item name in the database with said word to present said search results.

8. The query-and-response processing method according to claim 1, wherein:

said search criteria generation step comprises a step of determining an item under which a value is specified as search criteria; and

said output formatting step comprises a step of removing an item used as the search criteria from presentation items after the presentation items are determined and adding the value of said item to the presentation items as the description of said presentation items.

9. The query-and-response processing method according to claim 1, wherein an item under which a value is specified and for which no search data is included in the search results is excluded from presentation items during the selection of the presentation items at said output formatting step.

10. The query-and-response processing method according to claim 1, wherein said search criteria generation step comprises the steps of:

providing an item database containing all the values in a particular item that are held in a database to be searched; and,

if a specified value in criteria specification generated for an item is not contained in said item database, providing an alert to the user for indicating a search failure and the cause thereof before executing the entire search process.

11. The query-and-response processing method according to claim 1, wherein said search criteria generation step comprises the steps of:

providing an item database containing all the values in a particular item that are held in a database to be searched; and,

if no entry in said item database matches a specified value in the item in the search request, searching for entries having values similar to the specified value and presenting said similar values to the user as alternative value candidates from which the user can make a selection.

12. The query-and-response processing method according to claim 11, wherein said search criteria generation step comprises a step of presenting to a user an alternative to a specified value in an item, and, if said alternative is accepted by said user, storing the pair of the originally specified value and the alternative as synonymous words for the value in an item to use said pair to automatically widen criteria during the generation of search criteria.

13. The query-and-response processing method according to claim 1, wherein said search criteria generation step comprises the steps of:

generating search criteria to be first used in said search execution step;

determining whether the search succeeds or fails based on the number of results of the search performed at said search execution step; and

if it is determined that said search fails, widening the search criteria so as to increase the number of search sets; and

widening the search criteria and causing the search to be repeated at said search execution step until the search succeeds or the search criteria become unable to be widened.

14. The query-and-response processing method according to claim 13, wherein, if an item in the database to be searched is configured so as to correspond to a particular event, value specification for a particular item is extended to value specification for an event relating to the event associated with said item to widen search criteria.

15. The query-and-response processing method according to claim 13, wherein if the database to be searched is composed of structured text and the search criteria generated at said search criteria generation step specify a structure tag and corresponding text, said structure tag is replaced with a tag covering broader text range in a tag hierarchy to widen the search criteria.

16. The query-and-response processing method according to claim 1, wherein:

if the analysis at said search request analysis step fails, an alert concerning the form of the search request is provided; and

it is determined whether or not an item extracted as a topic in the search request at said search request generation step corresponds to an item in the database to be searched, and, if the analysis of the correspondence fails, an alert

is provided to the user for indicating that the query is outside the scope of the system.

17. The query-and-response processing method according to claim 1, wherein a list of keywords unique to each of various areas is provided and the list is used to determine the area of the search request at said search request analysis step; and

if it is determined that the area of the search request is not addressed by the system, an alert is provided to the user for indicating that the query is outside the scope the system.

18. The query-and-response processing method according to claim 1, wherein search criteria for an item on a main item list provided in advance are generated for a topic in the search request for which no correspondence to an item in the database is found at said search criteria generation step to repeat the search in each of the main items and present the search results to the user.

19. The query-and-response processing method according to claim 1, wherein the database to be searched is a text base structured with tags, and if the analysis of a search request shows that the query is about a word without tag, the word is first used to perform a simple keyword search without tag and the results of the search are classified by tag added to words to be searched to present the results to the user.

20. The query-and-response processing method according to claim 1, wherein the database to be searched is a text base structured with tags and, when text is entered into the database,

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a provided list of items essential to a subject covered by the text base is referenced to determine whether or not an essential item for one of items constituting a subject of the text to be entered is described in the text, and, if it is determined that the essential item is missing, a secondary database provided for the missing item is searched by specifying a value for a key item of the subject in said text to be entered and said text is complemented with a value obtained.

21. The query-and-response processing method according to claim 1, wherein, if a main database composed of a text base structured with tags and a secondary database holding values of tags contained in the main database are provided as databases to be searched and if there is a secondary database relating to an item in search criteria, the secondary database is first searched by specifying a value for an item to be searched for, a list of values for a key item is generated from a search set obtained, and then the list is replaced with a value specified for the tag to search through the main database.

22. The query-and-response processing method according to claim 1, wherein, if the database to be searched is a text base structured with tags, values for individual items are extracted and entered into individual databases at the same time when text is entered into the text database, and a group of spellings resembling each other is retrieved from each of the individual databases after the completion of the entry to enable a precise detection of variations in notation compared with that in a case where the entire text is searched.

23. A query-and-response processing program for a computer for receiving a search request concerning a query input by a user and searching a database to present search results to the user, said program performing:

a search request analysis process for analyzing said search request provided by said user;

a search criteria generation process for generating search criteria based on the result of the analysis of said search request;

a search execution process for searching said database according to the generated search criteria;

a query intention analysis process for analyzing the intention of the query based on the result of the analysis of said search request;

an output formatting process for selecting items to be presented to the user and determining the output format of search results according to the result of said analysis of the intention of said query; and

a presentation process for receiving the result of said output formatting process to present data to said user.

24. The query-and-response processing program for a computer according to claim 23, wherein:

said query intention analysis process comprises a step of determining a topic item, said topic item being a core topic of the search request; and

said output formatting process comprises a step of selecting an item to be presented to said user based on the determination whether or not the item is the topic item.

25. The query-and-response processing program for a computer according to claim 24, wherein: said output formatting process comprises a step of processing information by adjusting the order of the presentation items obtained as the search results.

26. The query-and-response processing program for a computer according to claim 24, wherein said output formatting process comprises a step of adjusting the level of detailedness of the presentation to provide all the specific items or only main items relating to a particular subject.

27. The query-and-response processing program for a computer according to claim 24, wherein said output formatting process classifies the search results according to specified item values to organize by category the information to be presented to the user.

28. The query-and-response processing program for a computer according to claim 23, wherein said output formatting process uses data specifying an item relating to a particular item to add the item relating to the particular item to the items to be presented, after the items to be presented to said user is determined.

29. The query-and-response processing program for a computer according to claim 23, wherein:

said search criteria generation process stores information about correspondence between a word used for specifying search criteria in an item in the database and an item name in the database; and

said output formatting process replaces said item name in the database with said word to present said search results.

30. The query-and-response processing program for a computer according to claim 23, wherein:

said search criteria generation process determines an item under which a value is specified as search criteria; and

said output formatting process removes an item used as the search criteria from presentation items after the presentation items are determined and adds the value of said item to the presentation items as the description of said presentation items.

31. The query-and-response processing program for a computer according to claim 23, wherein an item under which a value is specified and for which no search data is included in the search results is excluded from presentation items during the selection of the presentation items in said output formatting process.

32. The query-and-response processing program for a computer according to claim 23, wherein said search criteria generation process comprises the steps of:

providing an item database containing all the values in a particular item that are held in a database to be searched; and,

if a specified value in criteria specification generated for an item is not contained in said item database, providing an alert to the user for indicating a search failure and the cause thereof before executing the entire search process.

33. The query-and-response processing program for a computer according to claim 23, wherein said search criteria generation process comprises the steps of:

providing an item database containing all the values in a particular item that are held in a database to be searched; and,

if no entry in said item database matches a specified value in the item in the search request, searching for entries similar to the specified value and presenting said entries to the user as alternative item value candidates from which the user can make a selection.

34. The query-and-response processing program for a computer according to claim 33, wherein said search criteria generation process comprises a step of presenting to a user an alternative to a specified value in an item, and, if said alternative is accepted by said user, storing the pair of the originally specified value and the alternative as synonymous words for the value in an item to use said pair to automatically widen criteria during the generation of search criteria.

35. The query-and-response processing program for a computer according to claim 23, wherein said search criteria generation process comprises the steps of:

generating search criteria to be first used in said search execution process;

determining whether the search succeeds or fails based on the number of results of the search performed in said search execution process; and

if it is determined that said search fails, widening the search criteria so as to increase the number of search sets; and

widening the search criteria and causing the search to be repeated in said search execution process until the search succeeds or the search criteria become unable to be widened.

36. The query-and-response processing program for a computer according to claim 35, wherein, if an item in the database to be searched is configured so as to correspond to a particular event, value specification for a particular item is extended to value specification for an event relating to the event associated with said item to widen search criteria.

37. The query-and-response processing program for a computer according to claim 35, wherein if the database to be searched is composed of structured text and the search criteria generated in said search criteria generation process specify a structure tag and corresponding text, said structure tag is replaced with a tag covering broader text range in a tag hierarchy to widen the search criteria.

38. The query-and-response processing program for a computer according to claim 23, wherein:

if the analysis at said search request analysis process fails, an alert concerning the form of the search request is provided; and

it is determined whether or not an item extracted as a topic in the search request in said search request generation process corresponds to an item in the database to be searched, and, if the analysis of the correspondence fails, an alert is provided to the user for indicating that the query is outside the scope of the system.

39. The query-and-response processing program for a computer according to claim 23, wherein a list of keywords unique to each of various areas is provided and the list is used to determine the area of the search request in said search request analysis process; and

if it is determined that the area of the search request is not addressed by the system, an alert is provided to the user for indicating that the query is outside the scope of the system.

40. The query-and-response processing program for a computer according to claim 23, wherein search criteria for an item on a main item list provided in advance are generated for a query topic for which no correspondence to an item in the database is found at said search criteria generation process to repeat the search in each of the main items and present the search results to the user.

41. The query-and-response processing program for a computer according to claim 23, wherein the database to be searched is a text base structured with tags, and if the analysis of a search request shows that the query is about a word without tag, the word is first used to perform a simple keyword search without tag and the results of the search are classified by tag added to words to be searched to present the results to the user.

42. The query-and-response processing program for a computer according to claim 23, wherein the database to be searched is a text base structured with tags and, when text is entered into the database, a provided list of items essential to a

subject covered by the text base is referenced to determine whether or not an essential item for one of items constituting a subject of the text to be entered is described in the text, and, if it is determined that the essential item is missing, a secondary database provided for the missing item is searched by specifying a value for a key item of the subject in said text to be entered and said text is complemented with a value obtained.

43. The query-and-response processing program for a computer according to claim 23, wherein, if a main database composed of a text base structured with tags and a secondary database holding values of tags contained in the main database are provided as databases to be searched and if there is a secondary database relating to an item in search criteria, the secondary database is first searched by specifying a value for an item to be searched for, a list of values for a key item is generated from a search set obtained, and then the list is replaced with a value specified for the tag to search through the main database.

44. The query-and-response processing program for a computer according to claim 23, wherein, if the database to be searched is a text base structured with tags, values for individual items are extracted and entered into individual databases at the same time when text is entered into the text database, and a group of spellings resembling each other is retrieved from each of the individual databases after the completion of the entry to enable a precise detection of variations in

notation compared with that in a case where the entire text is searched.

45. A query-and-response processing program for a computer recording medium containing a program for receiving a search request concerning a query input by a user and searching a database to present search results to the user, said program performing:

a search request analysis process for analyzing said search request provided by said user;

a search criteria generation process for generating search criteria based on the result of the analysis of said search request;

a search execution process for searching said database according to the generated search criteria;

a query intention analysis process for analyzing the intention of the query based on the result of the analysis of said search request;

an output formatting process for selecting items to be presented to the user and determining the output format of search results according to the result of said analysis of the intention of said query; and

a presentation process for receiving the result of said output formatting process to present data to said user.

46. The query-and-response processing program for a computer recording medium according to claim 45, wherein:

said query intention analysis process comprises a step of determining a topic item, said topic item being a core topic of the search request; and

said output formatting process comprises a step of selecting an item to be presented to said user based on the determination whether or not the item is the topic item.

47. The query-and-response processing program for a computer recording medium according to claim 46, wherein said output formatting process comprises a step of processing information by adjusting the order of the presentation items obtained as the search results.

48. The query-and-response processing program for a computer recording medium according to claim 46, wherein said output formatting process comprises a step of adjusting the level of detailedness of the presentation to provide all the specific items or only main items relating to a particular subject.

49. The query-and-response processing program for a computer recording medium according to claim 46, wherein said output formatting process classifies the search results according to specified item values to organize by category the information to be presented to the user.

50. The query-and-response processing program for a computer recording medium according to claim 45, wherein said output formatting process uses data specifying an item relating to a particular item to add the item relating to the particular item to the items to be presented, after the items to be presented to said user is determined.

51. The query-and-response processing program for a computer recording medium according to claim 45, wherein:

said search criteria generation process stores information about correspondence between a word used for

specifying search criteria in an item in the database and an item name in the database; and

said output formatting process replaces said item name in the database with said word to present said search results.

52. The query-and-response processing program for a computer recording medium according to claim 45, wherein:

said search criteria generation process determines an item under which a value is specified as search criteria; and

said output formatting process removes an item used as the search criteria from presentation items after the presentation items are determined and adds the value of said item to the presentation items as the description of said presentation items.

53. The query-and-response processing program for a computer recording medium according to claim 45, wherein an item under which a value is specified and for which no search data is included in the search results is excluded from presentation items during the selection of the presentation items in said output formatting process.

54. The query-and-response processing program for a computer recording medium according to claim 45, wherein said search criteria generation process comprises the steps of:

providing an item database containing all the values in a particular item that are held in a database to be searched; and,

if a specified value in criteria specification generated for an item is not contained in said item database, providing

an alert to the user for indicating a search failure and the cause thereof before executing the entire search process.

55. The query-and-response processing program for a computer recording medium according to claim 45, wherein said search criteria generation process comprises the steps of:

providing an item database containing all the values in a particular item that are held in a database to be searched; and,

if no entry in said item database matches a specified value in the item in the search request, searching for entries similar to the specified value and presenting said entries to the user as alternative item value candidates from which the user can make a selection.

56. The query-and-response processing program for a computer recording medium according to claim 55, wherein said search criteria generation process comprises a step of presenting to a user an alternative to a specified value in an item, and, if said alternative is accepted by said user, storing the pair of the originally specified value and the alternative as synonymous words for the value in an item to use said pair to automatically widen criteria during the generation of search criteria.

57. The query-and-response processing program for a computer recording medium according to claim 45, wherein said search criteria generation process comprises the steps of:

generating search criteria to be first used in said search execution process;

determining whether the search succeeds or fails based on the number of results of the search performed in said search execution process; and

if it is determined that said search fails, widening the search criteria so as to increase the number of search sets; and

widening the search criteria and causing the search to be repeated in said search execution process until the search succeeds or the search criteria become unable to be widened.

58. The query-and-response processing program for a computer recording medium according to claim 57, wherein, if an item in the database to be searched is configured so as to correspond to a particular event, value specification for a particular item is extended to value specification for an event relating to the event associated with said item to widen search criteria.

59. The query-and-response processing program for a computer recording medium according to claim 57, wherein if the database to be searched is composed of structured text and the search criteria generated in said search criteria generation process specify a structure tag and corresponding text, said structure tag is replaced with a tag covering broader text range in a tag hierarchy to widen the search criteria.

60. The query-and-response processing program for a computer recording medium according to claim 45, wherein:

if the analysis at said search request analysis process fails, an alert concerning the form of the search request is provided; and

it is determined whether or not an item extracted as a topic in the search request in said search request generation process corresponds to an item in the database to be searched, and, if the analysis of the correspondence fails, an alert is provided to the user for indicating that the query is outside the scope of the system.

61. The query-and-response processing program for a computer recording medium according to claim 45, wherein a list of keywords unique to each of various areas is provided and the list is used to determine the area of the search request in said search request analysis process; and

if it is determined that the area of the search request is not addressed by the system, an alert is provided to the user for indicating that the query is outside the scope of the system.

62. The query-and-response processing program for a computer recording medium according to claim 45, wherein search criteria for an item on a main item list provided in advance are generated for a query topic for which no correspondence to an item in the database is found in said search criterion generation process to repeat the search in each of the main items and present the search results to the user.

63. The query-and-response processing program for a computer recording medium according to claim 45, wherein the database to be searched is a text base structured with tags, and if the analysis of a search request shows that the query is about a word without tag, the word is first used to perform a simple keyword search without tag and the results of the search are

classified by tag added to words to be searched to present the results to the user.

64. The query-and-response processing program for a computer recording medium according to claim 45, wherein the database to be searched is a text base structured with tags and, when text is entered into the database, a provided list of items essential to a subject covered by the text base is referenced to determine whether or not an essential item for one of items constituting a subject of the text to be entered is described in the text, and, if it is determined that the essential item is missing, a secondary database provided for the missing item is searched by specifying a value for a key item of the subject in said text to be entered and said text is complemented with a value obtained.

65. The query-and-response processing program for a computer recording medium according to claim 45, wherein, if a main database composed of a text base structured with tags and a secondary database holding values of tags contained in the main database are provided as databases to be searched and if there is a secondary database relating to an item in search criteria, the secondary database is first searched by specifying a value for an item to be searched for, a list of values for a key item is generated from a search set obtained, and then the list is replaced with a value specified for the tag to search through the main database.

66. The query-and-response processing program for a computer recording medium according to claim 45, wherein, if the database to be searched is a text base structured with tags,

values for individual items are extracted and entered into individual databases at the same time when text is entered into the text database, and a group of spellings resembling each other is retrieved from each of the individual databases after the completion of the entry to enable a precise detection of variations in notation compared with that in a case where the entire text is searched.

67. A query-and-response processing apparatus for receiving a search request concerning a query input by a user and searching a database to present search results to the user, comprising:

- a search request analyzing module for analyzing said search request provided by said user;

- a search criteria generating module for generating search criteria based on the result of the analysis of said search request;

- a search executing module for searching said database according to the generated search criteria;

- a query intention analyzing module for analyzing the intention of the query based on the result of the analysis of said search request;

- an output formatting module for selecting items to be presented to the user and determining the output format of search results according to the result of said analysis of the intention of said query; and

- a presentation module for receiving the result of said output formatting process to present data to said user.